

**Enmity In the Wind: Regulation of Transboundary Air  
Pollution in an Israeli-Palestinian  
Environmental Agreement.<sup>1</sup>**

Alon Tal

**Introduction**

Air pollution emerged as one of the most critical environmental problems in Israel during the 1980s, threatening the health and comfort of the Israeli public<sup>2</sup>. While most of the emissions originate along Israel's highly developed coastal plain, prevailing westerly winds transport copious quantities of pollutants towards the Judean and Samarian hills in the east. The steady increase in air pollution concentrations in these areas during this period bodes poorly for environmental coexistence between Israel and a Palestinian autonomy. Indeed, if emissions continue unabated, recent research suggests that air pollution levels in Jerusalem will become intolerable, reaching the pernicious levels found in Mexico City and Los Angeles within twenty years.<sup>3</sup> Given such grim and patently unsustainable trends, air pollution threatens to become a major source of contention between Israel and her new eastern neighbor.

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1. The thoughtful and instructive comments of Dr. Moshe Hirsch, from the Hebrew University Law School are gratefully acknowledged.

2. See A. Pruginin and Y. Glass, "The Environment in Israel in the Year 2000," (The Jerusalem Institute for Research of Israel, Jerusalem) 1992.

3. M. Luria, G. Sharf, and M. Peleg, "Forecast of Photochemical Pollution for the Year 2010, *Proceedings of the Twenty Fourth Conference of the Israeli Association of Ecology and Environmental Science* 1993)

In this chapter the magnitude of the air quality problem is assessed along with an analysis of its origins. The national policies and legal provisions in Israel intended to address the present situation will be detailed with a focus on their implementation. Requisite modifications are examined within the context of accepted international legal models to reduce transboundary air pollution. Inasmuch as the causes of Israel's present "air pollution crisis" go far beyond the realm of classical industrial sources (ultimately involving transportation, finance and even absorption policy), a comprehensive response must be considered.

The chapter ends with a review of environmental provisions in the nascent bi-lateral accords signed recently between Israel and the Palestinians and Jordan, along with a plea to decision makers to act speedily and creatively in this area. If the ongoing neglect of the air quality issue continues, it may soon take on divisive dimensions. Yet, bold measures have the potential to turn transboundary air pollution into a constructive element in the present Middle Eastern political equation.

#### **Transboundary Air Pollution: Defining the Problem**

Air pollution was the first environmental medium to be recognized and confronted in international agreements as a transboundary problem and not simply one which necessitated protection of global commons. In Scandinavia in particular, monitoring during the 1970s indicated high concentrations of sulfuric pollutants that were traceable to industrial activities outside the region. For instance, as a relatively non-industrialized nation, a full metric ton of sulfuric substances or 92 percent of the total loadings were discharged from foreign sources in highly impacted areas of Norway during the month of

August 1979.<sup>4</sup> During the following decade, highly publicized international controversies involving European or Canadian acid rain (caused by German or U.S. industries), the Chernobyl disaster and the documentation of ozone depletion and possible greenhouse global warming put transboundary issues squarely on the world's environmental agenda. International environmental law slowly moved forward to meet the challenge.

From a purely technical perspective, transboundary air pollution can roughly be defined as gasses or aerosols to which a given population or environment is exposed that originate in emissions released in another jurisdiction. Which pollutants become transboundary is determined by a range of factors including height of smokestacks, driving patterns, wind direction and of course proximity to geo-political borders.

Transboundary pollution is typically divided according to two criteria: a) constituents and b) effects.<sup>5</sup> Constituents generally involve gasses originating from combustion such as sulfur dioxide, nitrogen oxides and photochemical pollution as measured by ozone (O<sub>3</sub>) and to a lesser extent particulates such as sulfates. (Non-gaseous constituents such as metals typically fall out of the air pollution stream and do not travel as far.) When

<sup>4</sup> Similarly, it is estimated that 90% of air pollution in Switzerland originates outside its borders, and 82% in Sweden. See G.P. Smith, "Acid Rain: Transnational Perspectives," 4 N.Y.U.J. International and Comparative Law 459 as quoted in Kiss and Shelton, "International Environmental Law (Transnational: London) 1991" at 228. While no estimates are available for the West Bank, clearly it too is exposed to a high percentage of foreign-source pollution.

<sup>5</sup> See generally: Joseph. M. Alcaro and Eliodora Runca, "Some Technical Dimensions of Transboundary Air Pollution" *Transboundary Air Pollution* (C. Flinterman et. al. ed.) (Martinus Nijhoff- Dordrecht, the Netherlands) 1986 at 1-19.

human exposure to concentrations of these gasses exceeds threshold levels, they can cause a variety of adverse health effects, particularly respiratory impairment.

Effects, while often more difficult to measure, are of no less importance. Acid rain and visibility impairment are just two which fall into this second category of transboundary pollution. Given its emissions profile, Israel is increasingly the cause of transboundary constituents and effects in the West Bank. The situation is not "symmetrical." Both due to meteorological and industrial conditions, Palestinians contribute far less to air pollution concentrations and impacts within Israel. Consideration of the issue therefore requires a focus on Israeli air pollution sources and existing policies for abating emissions.

#### The Israeli Air Pollution Profile

Following extensive regulatory measures during the 1980s and 1990s, emissions from stationary sources of air pollution (industrial facilities) in Israel, particularly sulfur dioxide, stabilized and even dropped in many areas of the country.<sup>6</sup> Israel's electric utilities and oil refineries, which had previously operated without clearly defined emission limitations and with only sporadic technological guidance, complied with new "Personal Decrees" issued by Israel's Ministry of Environment.<sup>7</sup> Improvement in ambient air concentrations

<sup>6</sup> *Environmental Quality in Israel*, Annual Report 17-18, (Ministry of Environment, Jerusalem, 1992). See p. 13-18.

<sup>7</sup> An example of the new air emission permits can be found in "Provisions for Prevention of Air Pollution from Oil Refineries, Haifa (Amendment No. 3) issued pursuant to section 8 of the Abatement of Nuisances Law," April 13, 1992 reprinted in *Man and His Environment, Legal Aspects and Fundamental Concepts*, A. Tal Ed. 1993. The standards were enacted following extensive

as reflected in recent measurements at twenty-six monitoring stations scattered across the country's urban sector is dramatic.

For example in Haifa, SO<sub>2</sub> levels that had reached all time high levels in 1989 of 2600 mg/m<sup>3</sup> now rarely exceed<sup>8</sup> a new, stringent 1000 mg/m<sup>3</sup> absolute standard.<sup>9</sup> Indeed a 1994 study conducted by Israel's Electric Company<sup>10</sup> suggests that in none of the three Israeli cities traditionally considered to be the country's most severely polluted (Ashdod, Haifa and Tel Aviv) was the statistical standard of 500 mg/m<sup>3</sup> exceeded at all.<sup>11</sup> While past emissions reductions were primarily achieved by changing to lower sulfur fuels,<sup>12</sup> the Israel Electric Company's recent agreement to install additional costly control

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public pressures, an inter-Ministerial confrontation, ultimately won by the Ministry of Environment and litigation leading to a Supreme Court order in Adam Tevah v Din et. al. v. Ministry of Environment . (Unpublished Supreme Court Decision) 1992.

<sup>8</sup> See: Haifa Union of Cities Environmental Unit, 1993 Annual Report.

<sup>9</sup> Abatement of Nuisances Regulations (Unreasonable Air Pollution), 1992, K.T. no. 5435, p. 974.

<sup>10</sup> Hadar Almog, "Is There an Improvement in Air Quality in Israel?" *Proceedings of the 25th Conference of the Association for Ecology and Environmental Quality Sciences* . " 1994, p. 2.

<sup>11</sup> According to the 1992 ambient air standards, 0.25% of SO<sub>2</sub> measurements can exceed this lower "statistical" level before it is considered a violation.

<sup>12</sup> "The drop in SO<sub>2</sub> levels can be attributed to the notable reduction by the large sources for this pollutant, e.g., the Electric Company and the Oil Refineries..." *ibid.*



equipment, (i.e., scrubbers) will lower sulfur dioxide emissions even further.<sup>13</sup>

In stark contrast, an alarming deterioration in air quality resulting from mobile source pollution (exhaust of cars, trucks and buses) continues unchecked. According to data published by Israel's Ministry of Environment, since 1980 emission levels of oxides of nitrogen (hereinafter: NOx) have more than doubled with similar increases in the levels of carbon monoxide and hydrocarbons.<sup>14</sup> The aforementioned Electric Company study reports:

"In 1993 the deterioration in air quality continued regarding oxides of nitrogen in the Tel Aviv area. In 1992 111 exceedances of the absolute standard for NOx (94 mg/m<sup>3</sup>) were registered in monitoring stations in the Central Bus Station, while in 1993, at the same station 301 exceedances were measured... The levels of concentrations during the exceedances of the NOx in 1993 were higher and in several instances reached 2.8 times the standard."<sup>15</sup>

While Tel Aviv's air pollution problem primarily involves oxides of nitrogen, the salient transboundary hazard involves photochemical pollutants, air pollutants created from precursors' interaction with sunlight. Israel finally established an ambient standard for ozone, the primary indicator of

<sup>13</sup> Ruth Rottenberg, Legal Advisor, Israel Ministry of Environment, personal communication, Tel Aviv, June 30, 1994.

<sup>14</sup> *Environmental Quality in Israel*, op. cit., See tables of trends in "Air Quality" presented on pages 217-226.

<sup>15</sup> See: Hadar Almog, op. cit., also H. Almog, "Air Quality in Israel - Current Knowledge," in *Proceedings of the Twenty Fourth Conference of the Israeli Association of Ecology and Environmental Science* (Tel Aviv 1993).

photochemical pollution, in 1992<sup>16</sup>. While essential to atmospheric equilibrium as a filter of ultra-violet cancer-causing rays in the stratosphere, ozone is a noxious agent in the troposphere that humans breathe.<sup>17</sup>

A highly reactive oxidant and one of the main active ingredients in smog, high ozone levels cause immediate discomfort, impairment in lung function as well as athletic performance<sup>18</sup>, and can lead to permanent damage to lung morphology (fibrosis etc.)<sup>19</sup> following chronic exposures. As it is capable of causing mutation in cells, some scientists see it as a suspected carcinogen or at least a promoter of cancer-causing agents<sup>20</sup>.

Ozone is created by the interaction of sunlight and NO<sub>x</sub> and

<sup>16</sup> Abatement of Nuisances Regulations (Unreasonable Air Pollution), 1992, K.T. no. 5435, p. 974

<sup>17</sup> See generally, United States Environmental Protection Agency, *Quality Criteria for Ozone and other Photochemical Oxidants*,

<sup>18</sup> "These changes include reduction in respiratory unction performance, narrowing of large airways, increase nonspecific airway reactivity, alveolar inflammation, damage to pulmonary epithelial cells and increase leakage of vascular components into the lung," H. S. Koren et. al. "Ozone-Induced Inflammatory Response in Pulmonary Cells," (Research Triangle, N.C. U.S. EPA), 1993 at 4. For an excellent overview on the subject see: D. B. Menzel, "Ozone: An Overview of its Toxicity in Man and Animals," 13 *Journal of Toxicology and Environmental Health*, (1984).

<sup>19</sup> J.A. Last, et. al. "Long-term Consequences of Exposure to Ozone, I. Lung collage content, 72 *Toxicology and Applied Pharmacology*, (1984) p. 111-119.

<sup>20</sup> See for example, C. Hassett, et. al. "Murine lung carcinogenesis following exposure to ambient Ozone Concentrations," 75 *Journal of the National Cancer Institute*, 771-777 (1985)





hydrocarbons.<sup>21</sup> As such, it is a particularly problematic pollutant during the summer months. Created in the air while in transit, ozone is frequently a greater problem for populations downwind from the precursor emission source than the area surrounding its actual location. For instance, a "classic study" appearing in *Science* magazine in 1979 demonstrated that the relatively rural U.S. state of Connecticut suffers from higher ozone levels than neighboring New York City as it is upwind from the City's many NO<sub>x</sub> and hydrocarbon sources.<sup>22</sup>

A similar dynamic exists in Israel. Measurements from Jerusalem suggest that the ozone levels have increased each year since 1984, when systematic measurements began.<sup>23</sup> Yet, even in 1984, maximum ozone levels had already exceeded the national ambient standard of 230 mcg/m<sup>3</sup>, with both average and peak levels steadily increasing. Indeed more disturbing than the 344 mcg/l maximum level measured during 1991 was the 174 mcg/l average. This average concentration is 75 percent of the maximum permissible level, even though the figure includes the winter months, during which time ozone levels plummet. Hence, by the start of the 1990s, Jerusalem residents during the summer were regularly exposed to dangerously high levels of ozone.

<sup>21</sup> The reaction was first identified in the early 1950s in the now classic paper: A.J. Haagen-Smit, 44 *Industrial Engineering Chemistry* 1342, (1952). For example the most basic chemical equation for ozone's creation appears as:  $\text{NO}_2 + \text{Q} + \text{h}\nu (\text{sun}) \rightarrow \text{NO}_3 + \text{O}$

<sup>22</sup> W. S. Cleveland and T.E. Graedel, "Photochemical Air Pollution in the Northeast United States," 22 *Science* 203 (1979).

<sup>23</sup> *Environmental Quality in Israel, 1991* -92, (op. cit.) p. 222-223.

The increase in these pollutants is largely associated with the dramatic increase in automobiles in Israel. In 1960, some 70,000 registered vehicles drove on Israeli roads. This number has burgeoned to 1.2 million today, an increase of over 1700 percent.<sup>24</sup> The reason for the growth in fleet size are numerous and an incomplete list would include:

- salary bonuses for car owners;
- import tax exemptions on vehicles purchased by immigrants;
- rise in prices and perceived decreased quality of Public Transport;
- increase in suburban sprawl and the rise of multi-car families;
- cultural influences from the West;
- perceived connection between freedom and mobility; and
- rising per capita income along with exponential population growth.

During this time only moderate efforts were made to abate emissions from mobile sources. For instance the carbon monoxide emission standard for the annual inspection tests, set at 4.5 percent<sup>25</sup>, was more than three times that allowed in New York (1.2%)<sup>26</sup> or four times that in California (1.0%)<sup>27</sup>.

Only in 1991 did the Ministry of Transportation begin to require the

<sup>24</sup> See: Adam Mazor, *Israel in the Year 2000* (Life and Environment Publication: Tel Aviv) 1993.

<sup>25</sup> The Transportation Regulations, Reg. 318(A).

<sup>26</sup> New York State Chapter III Air Resources, Title 6, Environmental Conservation, Motor Vehicles Propelled by Gasoline engines, Subpart 217-1 (1960)

<sup>27</sup> See generally: Sierra Research Inc. *The Feasibility and Costs of More Stringent Mobile Source Emission Controls*, (Sierra Club In Sacramento CA 1998).

gradual installation of catalytic converters on new vehicles.<sup>28</sup> To be precise, catalytic converters per se are not required, but the new vehicle standards are sufficiently stringent to constitute a de facto catalytic converter requirement. While the Ministry of Environment expresses enormous optimism regarding the efficacy of the new requirements and their potential to reduce air pollution,<sup>29</sup> it is not clear that they are in fact a panacea.

For instance, typically, catalytic converters have an 80,000 kilometer life span. Yet due to the low quality of Israeli gasoline, and the corrosive impact of the fuel additives used to replace lead, anecdotal evidence suggests that the life span of converters in Israeli cars is far shorter, lasting only a year or two.<sup>30</sup> Policy makers must face the empirical experience of the United States where catalytic converters have not reduced air pollution levels after twenty years of mandatory use on a national basis with far cleaner fuel.<sup>31</sup>

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<sup>28</sup> The Transportation Regulations, Reg. 282(A) which to the second annex in the Regulations adopts the EEC Standard 88/76 with regard to emissions in new vehicles. Initially only automobiles in the 1992 fleet with engines 2000 cc and greater had to meet the new standards; in 1993 automobiles with engines 1600 or greater were added, and for the 1994 fleet, all cars were included.

<sup>29</sup> See: M. Graber, "Catalytic Converters in Mobile Vehicles - Costs versus Benefits" *The Biosphera*, Vol. 20 no. 6, (1992) p. 8-13.

<sup>30</sup> Professor Menachem Luria, Hebrew University, Chairman, Department of Environmental Science, personal communication, May 23, 1994.

<sup>31</sup> A. Tal, "Reform in the Prevention of Air Pollution from Mobile Sources," Towards the Era of the Catalytic Converter, *Biosphera*, Vol 22 p. 4-11, 1993.

Epidemiological research in Israel has already indicated the prevalence of adverse health effects in high pollution areas. In particular, surveys in Hebron suggest that air pollution is responsible for a range of health effects including asthma, exacerbation of heart problems and possibly cancer.<sup>32</sup> While little solid evidence is available, the rise in air pollution levels in Jerusalem suggests that much of the West Bank may face elevated concentrations as a result of Israeli emission sources. Attendant health impacts may also be significant. Air pollution consequently should be one of the central topics on the agenda of bi-lateral and multi-lateral negotiations on the environment.

In order to assess an appropriate approach within a bi-lateral or international treaty to address this problem, it is crucial to be familiar with existing Israeli air pollution legislation. Frequently the substantively meaningful provisions in environmental conventions are limited to calls for enactment of local legislation. Yet, if Israel's problem is not lack of a technical infrastructure but rather implementation and enforcement, international instruments should be designed accordingly.

#### Israel's Air Pollution Control Law

A cursory look at Israel's air pollution laws suggests that there is a substantial body of air pollution laws and standards exist. While the present Minister of Environment recently unveiled a proposed "Clean Air Law" which would integrate existing regulations under a single statute, it is not clear that the new legislation offers a fundamental change in the normative situation. As the

<sup>32</sup> See A. Goren and S. Hellman, "Prevalence of Respiratory Symptoms and Disease in School Children Living in Polluted Areas in Israel," *Environmental Research*, vol. 45, (1988) at 28. Other Israeli studies show elevated cancer risks, asthma rates and hospitalizations.

following section suggests, the reason that Israel's air pollution problem is so acute involves a shaky commitment to enforcement on the part of Israel's government authorities.

#### Control of Stationary Sources of Air Pollution

Stationary sources of air pollution can be regulated under two complementary statutes: The Prevention of Nuisances Law, 1961<sup>33</sup> and The Licensing of Businesses Law, 1966<sup>34</sup>. The Prevention of Nuisances Law is generally considered Israel's first piece of modern environmental legislation, and its somewhat primitive provisions remain basically unchanged since it was proposed and passed in the Knesset in 1961 as a private bill by M.K. Dr. Karavitch.

The "Karavitch law," in its 17 short provisions, establishes a skeletal legal framework for standard setting and abatement of environmental hazards. The law is written as a basic criminal statute to be enforced by the state, although citizens are granted the prerogative of filing private criminal or civil actions against polluters. Section 4 sets the stringent tone in the law by prohibiting considerable or considerable air pollution of the air outright.<sup>35</sup> Subsequent

<sup>33</sup> See English translation in *Israel's Environmental Legislation*, (M. Shalev, Editor) Israel Ministry of Environment, 1993 p. C-2.

#### Art. 4 (a)

A person shall not cause any considerable or unreasonable pollution of the air from any source whatsoever, if the same disturbs, or is likely to disturb, a person in his city or a passerby.

For the purposes of this section, "pollution of the air" means pollution by gases, fumes, dust or the like.

court decisions confirm that the law does not permit consideration of the economic merits of the polluting industry in implementing the law's proscriptions.

Basic ambient air quality standards provide a quantifiable working definition of unreasonable pollution. Following a Supreme Court petition in *Oppenheimer v. Ministers of Interior and Health*,<sup>36</sup> such regulations were promulgated defining air pollution levels presumed to be illegal.<sup>37</sup> These national ambient air quality standards, first enacted in 1971 were later amended as the 1992 ambient air quality standards.<sup>38</sup> Levels are set primarily according to the concentrations recommended by the World Health Organization. Beyond conventional pollutants (CO, SO<sub>2</sub>, NO<sub>x</sub>, Ozone), the regulations limit concentrations of several pollutants for which most countries have no ambient limits (e.g., cadmium vanadium, sulfate salts, styrene, toluene, trichloroethylene). In short, relative to other Western nations, Israel's ambient air quality standards are both stringent and expansive in scope.

For practical purposes, it is emission standards and not ambient ones that provide enforceable tools for achieving clean air. In this sphere, Israel's performance has been less than stellar. The Prevention of Nuisances Law provides the Minister of Environment with the authority to promulgate such

<sup>36</sup> Bagatz 295/ 65, Padi 20(1)309.

<sup>37</sup> According to section 10 of the law, if a defendant can prove that exceedance of an air quality standard does not actually bother or harm a plaintiff or any individual, in theory an exceedance of the air quality regulations will not constitute a violation of the law. No case of such a decision in the area of noise or air pollution, however is on record.

<sup>38</sup> Prevention of Nuisance Regulations (Air Quality) 1992, K.T. 5435, (6.4. 1992) at p. 973-974.

emissions limitations either in the form of a performance or a technology standard called "personal decrees."<sup>39</sup> Yet this authority has been used sparingly since the law's inception over thirty years ago. Less than 20 decrees have been issued, although, many of Israel's largest industrial facilities (and potential polluters) have been served personal decrees over the years. Regulated industries include Electric Power Plants, Oil Refineries, Cement Factories and Quarries.

There are many reasons, historical and institutional, for the conspicuous lack of emission standards. Since the inception of the Ministry of Environment in 1989, a tactical decision to regulate emissions under the Licensing of Businesses Law is one of the primary reasons. This law, an outgrowth of a pre-state Mandatory ordinance, is a sweeping statute which creates a bureaucratic framework for licensing most of the nation's business.<sup>40</sup> The Ministry of Interior has compiled an extremely comprehensive list of businesses that are required to have a license to operate and issued an administrative order to that effect. Yet under the law it is the Ministry of

<sup>39</sup> Sec. 8: "The Minister, or a person appointed by him for that purpose, may direct a particular person to adopt measures for the prevention of any contravention of section 2,3 or 4." In the law's original form this authority lay in the hands of the Ministers of Interior and Health.

<sup>40</sup> This 1968 statute is the first Israeli law to include the concept "environment quality," citing it as the first goal of the licensing process: "suitable quality of the environment, including appropriate sanitary conditions, prevention of hazards and nuisances and ensuring compliance with planning and building laws and fire services".

Environment, along with local Municipal authorities, who are authorized to specify the environmental provisions in licenses.<sup>41</sup>

In recent years, the Ministry of Environment has frequently stated its preference for regulation of emissions through the Licensing of Businesses Law. In a 1993 memo to local environmental units, the Ministry's Air Pollution Department endorsed Germany's "T.A. Luft"<sup>42</sup> (an industry-specific scheme, largely considered Europe's most comprehensive --and stringent-- air emissions regulations) as a recommended basis for emission limitations in business licenses. There are undoubtedly cases where generic standards are not appropriate to the specific climatic and background environmental conditions in Israel. Additionally, integration of T.A. Luft standards will take time. Nonetheless, the existence of available, readily applicable emission limits promises to mainstream the regulatory process for stationary sources of air pollution.

#### Mobile Sources

Mobile sources of pollution are regulated under four different statutes. The most important of these are regulations promulgated by the Ministry of

<sup>41</sup> Under the law, Municipalities serve as the Licensing Authority, while the Ministry of Environment serves as "provider of the license." (In a few industries, the Ministry of Health fills this role, such as in the licensing of cosmetics, pharmaceutical and food products).

<sup>42</sup> Technical Instruction on Air Quality Control, TI Air - TA Luft of 1986, promulgated pursuant to the Federal Emission Control Act (BImSchG- 1974).

Health under the Public Health Ordinance<sup>43</sup> and specifications originally issued by the Ministry of Interior (today Environment) under the Prevention of Nuisances Law.<sup>44</sup> These two sets of regulations adopt different approaches in monitoring the black smoke found principally in diesel exhaust. The Public Health regulations prefer the Ringleman test. The Ringleman test is an extremely simple visibility scale composed of four squares with ascending levels of darkness to which inspectors compare the opacity of exhaust. A black color comparable to 60 percent opacity constitutes illegal emissions. The Prevention of Nuisances regulations utilize the Hartridge Test which uses infrared beams to measure the opacity of exhaust. Hartridge measurements are considered more accurate than the Ringleman visual tests but is basically unavailable for use in the field.

Both regulations have been utilized, albeit sparingly, over the years for enforcement activities by the competing agencies<sup>45</sup> who frequently argued over the relative merits of each approach (precision versus availability). There are historical/institutional reasons for the disparity, but today with a single Ministry of Environment in charge of both statutes, there is compelling reason for unification, and in light of criticism by the court<sup>46</sup>, regulatory revision is likely

<sup>43</sup> The Public Health Regulations (Vehicle Emissions) 1980.

<sup>44</sup> The Prevention of Nuisances Regulations (Air Pollution from Vehicles) 1963.

<sup>45</sup> See for example the Supreme Court's upholding of the criminal conviction of a Jerusalem bus driver under the Transportation Regulations for emitting black smoke in *Avishar v. State of Israel*.

<sup>46</sup> *Dan, Cooperative Union for Public Transport Ltd v. State of Israel*, J1983, p. 150

and the Ministry of Environment is trying to gain support from other Ministries for its enactment.

Yet, ultimately these standards are only relevant for diesel-based vehicles which produce the black smoke. In Israel, these account for something less than 10 percent of the overall fleet. Of much greater importance from the perspective of the NOx and ozone pollution problems described above are the limitations placed on gasoline vehicle emissions and their enforcement.

New car emission standards as well as ongoing inspection level tests for CO are set by the Ministry of Transport. Recent tightening of standards mandating a maximum 1.5% carbon monoxide level in new vehicle exhaust serves the functional equivalent of requiring catalytic converters in vehicles and mandating unleaded fuel in gasoline.<sup>48</sup> Inspection of vehicle exhaust is conducted as part of the annual inspection "test" available at specially licensed private garages.

The seriousness of these inspections has increasingly been called into question. A Ministry of Environment study released in 1994 determined that some 21 percent of automobiles leaving inspection sites exceed the 4.5% standard for old vehicles.<sup>49</sup> In another study, random checks of automobiles in

<sup>47</sup> Proposed Prevention of Nuisances Regulations (Air Pollution from Vehicles) 1991, (copy on file with author or at the Ministry of Environment).

<sup>48</sup> Transportation Regulations, 318A.

<sup>49</sup> Y. Gabai, S. Brenner, "Levels of Carbon Monoxide in Parking Lots and in Automobile Emissions," *Proceedings of the 25th Conference of the Association for Ecology and Environmental Quality Sciences*

the Tel Aviv area indicated even greater non-compliance with over fifty percent of randomly stopped cars emitting double or more than the same level standard.<sup>50</sup>

There are several obvious factors that explain the widespread violation of vehicle emission standards.

Spot checks conducted by the author at different licensing garages suggest that frequently the emission test is conveniently skipped, presumably to increase the likelihood of passage and gain the loyalty of annual consumers. Unlike brakes performance, apparently inspectors do not consider air emissions an essential vehicle parameter.

The quality of gasoline in Israel is so poor that even well tuned cars frequently produce noxious emission levels.<sup>51</sup> Indeed, as mentioned, Israel's gasoline is undermining the environmental gains of catalytic converters.<sup>52</sup>

Under the law, only one air pollution parameter is checked - carbon monoxide. A nitrogen dioxide emissions limit (which exists in states like New York<sup>53</sup>) has

<sup>50</sup> "Data File" *Politica*, No. 47(1993) p. 37

<sup>51</sup> In a November 1992 symposium on mobile source pollution, the chief engineer of the Egged Bus Cooperative described the dramatic increase in emissions in a newly imported German Mercedes bus, once Israeli fuel replaced the German fuel with which the bus arrived.

<sup>52</sup> Luria, Personal Communication, *op. cit.*

<sup>53</sup> New York State, Chapter III Air Resources, Title 6, Environmental Conservation, Motor Vehicles Propelled by Gasoline Engines, Subpart 117-1 (1960)



...to be regulated directly. ... is a more problematic air pollutant

•Finally, Ministry of Transportation oversight is inadequate. Their field personnel only check the precision of the monitoring equipment and do not assess the vigorousness or regularity with which emission tests are applied.<sup>54</sup>

The above suggests that legislative solutions alone will not be sufficient to materially decrease air pollution from mobile sources, particularly given the continued growth in Israel's fleet size. An international agreement to improve air quality therefore, must bear in mind the true causes of the precipitous rise in air pollution levels and address them head on. The following section considers conventional approaches to international air pollution control efforts and how they might apply to the region. This creates an overall context in which to assess the first relevant bi-lateral agreements in the region.

#### **International Agreements to Reduce Transboundary Pollution: Relevant Models**

The evolution of international law and agreements involving transboundary air pollution control is too expansive a topic for a thorough review in the present context. Nor will the appropriate format of an air pollution accord (multi- or bi-lateral) be discussed, although there are profound substantive implications. Nonetheless, even a cursory glance at different strategic models found in multi-lateral and bi-lateral agreements about air

<sup>54</sup> Telephone Interview with Attorney Eli Avid, Legal Department, Ministry of Transportation, (November 12, 1992).  
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quality are highly instructive and suggest clear directions for future negotiations.

#### **Descriptive Prescriptions for Domestic Legislation**

Calls for enactment of national legislation by member states on environmental topics is perhaps the oldest approach of environmental treaties. Ironically one of the broadest of such agreements involving transboundary air pollution can be found in the United Nations Convention on the Law of the Sea (UNCLOS)<sup>55</sup> which calls for regulation of pollution through the atmosphere. An older example is the European Declaration of Principles on Air Pollution Control.<sup>56</sup> It calls for national legislation that aims to reduce pollution on a source specific basis, calling for a two-tiered regulatory strategy of general permitting of automobiles and installations that pose insignificant risks as opposed to site-specific limits for stationary sources with high polluting potential.

While there may be great symbolic importance to such vague requirements, without clear quantitative goals or substantive provisions, it is difficult to attribute significant progress in air pollution reduction as a result, notwithstanding the relatively disciplined context of the European Community. Nonetheless, in situations where nations potentially involved in a regional air pollution controversy have not universally enacted state-of-the-art or even conventional ambient air quality standards (as is the case for Jordan and the Palestinians), the approach can provide valuable leverage.

<sup>55</sup> Sec. 212 U.N. Doc A/CONF 62/122 (1982)

<sup>56</sup> Resolution 68(4) approved by the Council of Europe in 1968.  
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### Cooperative Agreements/Information Transfer

Perhaps the most notable multi-lateral convention designed to reduce air pollution by facilitating cooperation is the Geneva Convention on Long-Range Transboundary Air Pollution. Signed by 31 nations in 1979, the convention went into force in 1983.<sup>57</sup> The convention itself contains few obligations with no concrete quantitative goals with emissions reduction targets.<sup>58</sup> The primary operative provisions involve information transfer and consultation. Contracting states are required to exchange information and review their air pollution policies, scientific activities and technical measures.<sup>59</sup>

While some commentators believe that such mandatory exchanges have the effect of placing the environmental issue on the national agendas of countries and expediting an international monitoring network,<sup>60</sup> there is little to indicate from the European experience that such provisions actually facilitated reductions in emissions or ambient levels of pollution. Yet it has been pointed out that such provisions constitute a prerequisite for successful compliance

<sup>57</sup> UN Document, E/ECE/987, February 4, 1980.

<sup>58</sup> The language in article 2 requires only: "to limit as far as possible, gradually reduce standard pollution including long-range transboundary pollution" *ibid.*

<sup>59</sup> *Ibid.*, article 4. Article 5 includes similar requirements for "consultation" at an early stage between impacted states "exposed to a significant risk of long-range transboundary air pollution and those states . . . There is no clear operational" from which the pollution originates objective to "consultations" within the context of the Convention, and certainly they imply no substantive requirements for polluting states beyond participation in the consultation process.

<sup>60</sup> See Kiss and Shelton, *International Environmental Law* 234-235.

monitoring between parties to an air pollution agreement.<sup>61</sup> This is particularly true, given nations' tendency to summarily deny contributing to transboundary air pollution problems when the issue is raised in a political context.<sup>62</sup> Compulsory information swapping and access to emissions data can serve as a less than subtle source of pressure to violating countries.

### Quantifiable Pollution Reduction Goals

The situation is fundamentally different in cases where specific air pollution reduction goals have been introduced into the language of environmental treaties themselves. This can consist of delineating reduction targets or, alternatively, setting ambient air quality goals regionally, thereby implying emissions reductions, freezes or ceilings. While such targets are common in national legislation<sup>63</sup> and regulation, the first such case internationally was a Helsinki Protocol, adopted by 21 of the Geneva Convention countries.

The Protocol calls for a 30 percent reduction in annual sulfur emissions by 1993, based on 1980 levels. A similar measure in Sofia, signed by 25 states calls for a freeze of nitrous oxides emissions and their "transboundary fluxes" at 1987 levels by 1994. "Phase outs" (e.g., the gradual elimination of ozone

<sup>61</sup> Dr. Moshe Hirsch, Jerusalem, Israel, personal communication, August 25, 1994.

<sup>62</sup> This has been the case in Europe and more recently between the U.S. and Canada. *ibid.*

<sup>63</sup> For example section 202 of the 1970 U.S. Clean Air Act Amendments called for 90 percent reductions in hydrocarbon and carbon monoxide emissions by 1975. 42 U.S.C.

depleting chemicals under the Montreal Protocols)<sup>64</sup> are an even more dramatic (and verifiable) example of such measures. Most recently, the 1991 agreement between the U.S. and Canada offers an excellent example of how such an agreement is drafted in a bi-lateral context.

Emission reduction targets allow nations to maintain control over the appropriate regulatory strategy, thereby maintaining basic sovereignty to consider a range of social policy considerations when crafting regulatory strategies. At the same time, the approach imposes environmental responsibility within the international sphere. While not without its complications and controversies (particularly with regard to setting of baseline levels for goal-setting<sup>65</sup>), initial indications suggest that placing quantitative goals offer clear advantages over descriptive provisions. First of all, it is easier to assess the success of an international instrument. For example, by 1986, ten of the twenty-one Helsinki signatory states had met the 30 percent reduction target<sup>66</sup>. Second, such legislation provides strong support for internal environmental lobbies, both Ministerial and non-governmental to press for tough regulatory policies, whereas descriptive language provides far greater latitude for inaction.

<sup>64</sup> As reprinted in the *International Environmental Reporter* 21:352, 1991.

<sup>65</sup> For instance, Great Britain's refusal to sign the recent sulfur dioxide protocol was the result of a claim that the baseline year established was purportedly too inflexible. Hirsch, *op. cit.*

<sup>66</sup> Kiss and Shelton *op. cit.* at p. 235.

### Technological Standards

The European Community has issued a series of air quality directive regional directives which set technology-based standards, primarily prescribing performance standards and technologies for specific vehicle types.<sup>67</sup> Similar fuel standards for lead are set according to regional agreements.<sup>68</sup> Another type of limitation can be seen as the decision to prohibit stack height as an pollution control option in the United States. While there is no "international treaty which stipulated this position, it is clear that this technological provision is driven by transboundary air pollution concerns.

While technology standards by definition tend to be source or vehicle specific, they can be extremely valuable when a particular sector's emission reductions are identified as essential to environmental progress. This happens to be the case with motor vehicles in many countries of the world. It is also worth noting that regional agreements can have a "ripple effect" far outside their jurisdiction. Indeed, Israel has linked its own internal standards for car emissions to the European standards appearing in the EEC directive.<sup>69</sup>

<sup>67</sup> For instance, Directives 72/306 (1972) and 77/537 (1977) regarding diesel engines in conventional and agricultural vehicles.

<sup>68</sup> Directive, 85/851 (1985).

<sup>69</sup> See Regulation 318(A) (as amended in Amendment 3-1991) of the Transportation regulations, which includes a reference to European Directive 88/76 (1988).

### Air Pollution Provisions in Initial Palestinian and Jordanian Agreements

On April 5, 1994, Israel and the Palestine Liberation Organization signed the so-called Cairo Agreement in Cairo which stipulates both procedural and substantive arrangements during the transitional period in the fledgling Gaza-Jericho Autonomy.<sup>70</sup> Section 35 of the Agreement is entitled "Environmental Protection" and contains basic principles regarding a range of environmental issues, including air pollution control. Following a general commitment by the parties to "act for the protection of the environment and prevention of environmental risks, hazards and nuisances" 35(b) includes specific legislative commitments regarding air pollution:

"Israel and the Palestinian Authority shall respectively adopt, apply and ensure compliance with internationally-recognized standards concerning acceptable levels of land, air, water and sea pollution... which may affect each side and the Settlements and the Military Installation Area."<sup>71</sup>

The agreement also contains a commitment to provide "any relevant information concerning development activity and its environmental impact" if one of the sides believes that there might be a threat to its environment.<sup>72</sup> In

<sup>70</sup> Environmental Provisions issued by Israel Ministry of Environment, Chozar Mankal, September 1984, 7-9.

<sup>71</sup> *Ibid.*, Sec. 35A

<sup>72</sup> 35(d) "In the event that Israel or the Palestinian Authority considers that there might be a threat to its environment, any relevant information concerning the development activity and its environmental impact shall be provided by the relevant side

addition, an "emergency warning system" that will respond to accidents which may generate environmental pollution should in theory some air pollution component, particularly for hazardous emissions.<sup>73</sup> The agreement establishes "an Environmental Experts committee coordination of environmental issues to be convened when the need arises.

The above language is minimalist, and within the air pollution realm yet to be applied in any meaningful way.<sup>75</sup> Yet, a cursory assessment agreement suggests that the sides have elected to pursue the first two aforementioned models of international air pollution control namely:

- *Descriptive Prescriptions for Domestic Legislation*
- *Information Transfer.*

As previously stated, these are the least binding and mechanisms for reduction of pollution. Yet their attendant benefits: international commitments' ability to leverage policy makers and information exchange role in compliance monitoring, have the potential to catalyze policy changes actual control strategies. This is particularly true in a case where the Palestinian legislative infrastructure is still incipient and Israeli mobile source, air pollution laws and policy are not sufficiently stringent and broad to address present quality trends.

<sup>73</sup> *Ibid.*, 35(e).

<sup>74</sup> *Ibid.*, 35(g).

<sup>75</sup> Telephone interview with Mr. Dror Amir, Special Assistant for International Affairs, Israel Ministry of Environment, Jerusalem September 25, 1994.

...during the negotiations at Ein Avrona between Israel and Jordan, a two-page Environmental Cooperation Agreement "Ad Referendum" was initiated by the Director General of Israel's Ministry of Environment and the Jordanian environmental negotiations group leader. While less specific and thorough than the Palestinian document, the sides do agree to cooperate in matters relating to environmental protection in general. Among the ten subjects set forth in Section C of the Agreement is "Air quality control, including general standards, criteria and all types of man-made hazardous radiation, fumes and gasses."

The specific projects targeted in the second page of the agreement, however, are limited to marine pollution prevention in the Gulf of Aqaba and Ecological protection in the Jordan Valley. This would suggest that Air Pollution is not high on either nation's environmental agenda. It is therefore unlikely that the agreement and the ensuing discussions will give rise to meaningful air quality initiatives and controls by either party.

#### **Conclusion: Towards Pollution Reduction Targets**

There is little doubt that given the right political circumstances during negotiations, air quality might benefit from the Peace Process presently unfolding between Israel and its neighbors. Yet, for this to happen it is crucial that the next round of environmental accords include substantive provisions that recognize, at the very least, key elements of the region's air pollution situation:

\*Israel's pollution profile has changed. Exceedances of ambient air quality standards are primarily attributable to mobile source emissions, producing problematic NOx and ambient ozone levels.

\*While in a few anomalous cases activities of Palestinians in the West Bank will contribute to air quality deterioration within pre-1967 Israel, the primary movement of air pollution tends to be easterly. Hence, the Gaza Strip does have the potential to exacerbate Israeli air pollution exposures.

\*As long as the fleet size and vehicle miles driven continue to increase, it will be difficult to reduce these pollutants materially for the foreseeable future.

\*Reasonable air pollution statutes and standards are already in force in Israel. Better implementation and enforcement is more likely to lead to improvement in air quality than more legislation. Palestinian (and Jordanian) air quality legislation is still undeveloped.

Given these factors it would seem that there are a few clear directions which an effective environmental accord regarding air quality might take. First of all, the agreement must be more specific and professional. The initial accords appear to be largely symbolic, and given the general language are unlikely to produce public policies that reverse the unsustainable ambient trends. As present agreements already call for exchange of information and internal legislation, at the heart of a new, comprehensive accord should be emission reduction targets.

Present emissions in Israel can be associated with elevated air pollutant levels in the West Bank, and all projections anticipate a worsening of conditions. These same models are capable of projecting the degree of emission reductions necessary to ensure compliance with international or frequently more stringent Israeli ambient air quality standards.

With regard to stationary source pollution, while sulfur dioxide levels are at a steady state in Israel (or even dropping), an environmental agreement would constitute an opportune time to freeze emissions at present-day levels in Israel in order to ensure that concentrations of this classic transboundary pollutant do not increase. It can be argued that Palestinians should be granted some pollution credits beyond present emission levels to account for anticipated industrial development. But in this age of "sustainable development," given the availability of clean fuel from much of the Arab World and the proven efficacy of pollution prevention techniques and technology, there is no reason that all new sources in the region (especially Israeli) shouldn't be held to higher environmental standards. With the tremendous importance of tourism to the region, such a regional strategy is particularly sensible.

Ultimately, the greatest challenge in the transboundary pollution profile are the gasses produced by mobile sources. An environmental accord should include an iron-clad commitment to reduce transboundary pollutants from Israeli sources by a scientifically defensible amount (e.g., 20 to 40 percent in nitrogen oxide and hydrocarbon reduction, with these levels only acceptable if there is an attendant drop in ambient ozone concentrations). Palestinian emissions should be capped at a comparable per capita vehicle level.

Implementing such a provision will be both complex and expensive. But such an approach offers the most feasible strategy. Both politically and technically, at the present stage, it simply may not be possible to mandate particular control measures or strategies. As diffusion of non-polluting electric and "super cars" technologies is at least two decades away<sup>76</sup>, a range of

<sup>76</sup> Amory B. Lovins and L. Hunter Lovins, "Reinventing the Wheels," Author's draft, to be published in *Atlantic Monthly*, 1994.

medium and long-term policies might be employed to achieve air quality. Decreasing vehicle mileage is an obvious but particularly daunting objective. While there are many empirically proven environmental advantages associated with upgrading train and bus service (most notably preservation of open spaces), improved and less expensive public transport does not guarantee a reduction in driving or air pollution dramatically.

Even if public transport usage increased significantly and success brings private vehicle driving rates down, if Israeli buses continue to operate at present emission levels, there may even be a net environment. International air pollution expert Professor Menahem Luria of Bar Ilan University has noted that in many cases the NOx emitted by Israel's "E" buses is greater than that emitted by 50 private automobiles.<sup>77</sup> Bus companies in turn blame any inferior emissions quality on the quality of fuel imported from Israel.

In short, environmental advances may be made in mass transit, but it will require fundamental qualitative and quantitative changes in transportation availability, citizen involvement and a concomitant government commitment to reducing automobile usage. Making driving more "eco-friendly" is certain to be unpopular and poses a considerable political challenge. In short, any of the above measures would be extremely difficult to implement precisely into environmental conventions and of course would be unprecedented.

Assuming mobile source air pollution reductions are achieved through control technology diffusion and not through transportation policies, making the changes in an international instrument is no simpler. As described

<sup>77</sup> Luria personal communication, *op. cit.*

there is a clear need for statutory and institutional revision in Israeli Ministries' auto emissions regulatory activities. In order for mobile source control programs to be effective and ensure the ongoing efficacy of emissions control equipment, "Inspection and Maintenance" regimes (I&M) must be extremely sophisticated and tough.

When designed and run properly, "I&M" programs have cut hydrocarbon emissions by as much as 42%, and bring about a 26% and 24% reduction in CO and NO<sub>x</sub> emissions respectively.<sup>78</sup> But this requires the participation of the Ministry of Transportation, automobile importers, mechanics, and of course, the general public. It also costs money in increasing the frequency of tests for older cars, replacing parts, and improving gasoline quality. Here too, this is hardly the stuff of international treaties.

Hence setting emission reduction goals would seem to be the optimal approach to ensure a reduction in transboundary air pollution levels in the area. It will undoubtedly initially place a heavy burden on the Israeli public (although during the years ahead, Palestinians may well share the inconveniences and costs). Integrating other elements from international air pollution treaties would most likely make an air pollution agreement appear more even-handed at the outset.

For instance, an accord should include the requirement for domestic legislation, ambient standards and regulatory enforcement by Palestinian authorities along with monitoring and information exchange provisions with timetables for implementation. Such measures are basically in place in Israel but

<sup>78</sup> See generally the comprehensive report: Sierra Club Research Inc. *The Feasibility and Costs of More Stringent Mobile Source Emission Controls*, Sacramento California: Sierra Research Inc., (1988).

will place a substantial challenge to a fledgling Palestinian autonomous case, Palestinian emissions should be capped close to present levels to assuage any Jordanian concerns regarding the impact on their air quality. Palestinian jurisdiction experiencing rapid development.

To the extent that it is likely that Palestinian vehicle ownership will continue to rise and that many Palestinian cars will continue to travel inside Israel, there is an overwhelming rationale for imposing singular standards on automobiles in the two jurisdictions, presumably EEC standards. Such a policy will eliminate any competitive advantage that Palestinians might enjoy over their Israeli colleagues, would indicate a commitment to regional preservation of air quality and most important, protect the Palestinian population itself from high NO<sub>x</sub>, CO and hydrocarbon levels.

Air pollution controls are not without attendant expenses. Beyond philosophical or public health considerations, however, with the anticipated growth in the tourist industry, economic pragmatism dictates as well a commitment to air pollution prevention. Air quality is a key national asset which requires investment to maintain. If the air in Jerusalem does resemble Mexico City, constituting a hazard for people with respiratory ailments or heart conditions and becoming abrasive to the Holy and historical sites of the area, it will carry with it an enormous economic price tag. These expenses can quickly come to dwarf any aesthetic or existential costs.

The plummet in air quality in Israel suggests that such intrinsic costs have been inadequate to convince political leaders to make air pollution reduction a priority, particularly from emissions from mobile sources. New international circumstances have the potential to change this. Given the severity of the present situation, ongoing contamination of the air may not be seen as inconsiderate, but could also become a potentially disastrous

factor in the politics of the region. Perhaps the overriding desire to forge a lasting peace accord will finally serve to leverage a new, more responsible national air pollution policy in Israel and the Palestinian autonomy.

*Dr. Alon Tal is director, Israel Union for Environmental Defense, Tel Aviv.*